

Asbestos-Associated Pleural Mesothelioma in School Teachers: A Discussion of Four Cases^a

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The strong relationship between mesothelioma and asbestos is well documented.¹ While many agents other than asbestos may induce mesothelioma experimentally, and erionite mineral and therapeutic radiation are known to cause small numbers of mesotheliomas in humans,²⁻⁴ recent reports suggest that as many as 90 percent or more of human mesotheliomas result from asbestos exposure.⁴⁻⁶ That these mesotheliomas may be caused by low-level asbestos exposure is indicated by instances where it has been related to environmental, neighborhood, domestic or short-term exposures.^{6,7} This situation has raised concerns regarding past use of asbestos in public buildings, schools being one of the main areas of concern.^{7,8} The present report concerns four cases of malignant mesothelioma occurring in school teachers who worked in schools that were insulated with asbestos and who had no other known exposure to this mineral. All information reported herein was obtained from deposition transcripts and independent laboratories (transmitted by various attorneys), or by review of available medical records and specimens.

CASE REPORTS

Case 1. A 60-year-old man was found to have a left pleural effusion. Cytological examination of the effusion fluid showed mesothelioma cells. Pleurectomy was performed in September 1985 and the diagnosis of mesothelioma was confirmed pathologically. The patient died in March 1986. Autopsy revealed a mesothelioma encasing the left lung and spreading to lymph nodes and the abdomen.

The patient had worked as a school teacher in Chicago, Illinois. There was asbestos insulation in the school where he taught. This asbestos was used for fire protection, in acoustic ceiling tiles, and as pipe insulation. Analyses of the asbestos are pending. The patient denied any previous occupational exposure to asbestos, including shipyard or building trades employment, or auto repair work.

The patient had been in the Navy for one and one-half to two years. His principal duty was as a radar man. Immediately after leaving the armed services, he began work at a City of Chicago playground. Subsequently, he began his studies at a local teacher's college and then a local university. In 1954, his career

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least several decades earlier. While most children exposed to asbestos fibers will likely live long enough to manifest a predisposition to mesothelioma,^{10,11} many exposed adults will die from other causes before mesothelioma develops.

All of the four patients were diagnosed after pathology review as having malignant mesothelioma. The unusual presentation in case 4 suggests that the diagnosis may have been incorrect. It is included in this series insofar as a diagnosis of malignant mesothelioma was made (and not revised) and the case otherwise met the criteria stated at the beginning of this report.

The four cases described herein are the first to be described among school teachers with no other apparent asbestos exposure. They are also the first reported nonfamilial instances in which passive contact with asbestos has been related to mesothelioma; there is at least one other teacher who has developed mesothelioma, but who may have been exposed to asbestos in non-school as well as school settings. None of these persons physically handled the asbestos in the course of his or her employment as a teacher. Sources of asbestos fibers in schools include sprayed-on insulation ceiling tiles and pipe insulation. There are also at least three cases of malignant mesothelioma (in persons aged 30–45 years at the time of presentation) where the only known exposure to asbestos was when they were students. Moreover, three other cases have come to our attention in persons who had no known exposure to asbestos aside from their work places (i.e., office buildings and the like). One person was an accountant, one a computer programmer, and one a cleaning person.

The period of time from first exposure until diagnosis of the mesothelioma for the fourth case may seem overly short. However, cases of mesothelioma in which this period has been as short as 10 years have been reported in the literature.^{12–22}

In Chicago, in order to comply with local building codes, the ventilation system of many schools uses a fan to ensure that a constant proportion of the air in the school is "fresh." This fan is generally located in the boiler room of the school. As a result, the "fresh" outside air is forced through the boiler room before it circulates into the classrooms. It is possible that the asbestos insulation present in such rooms is carried by this air into other parts of the school building. The likelihood of such fiber spread would be greater if the insulation material were in a friable state. However, there have not been any measurements in rooms with friable insulation, and such measurements are needed to properly assess the importance of this possible source of asbestos fibers in the schools.

The continued presence of asbestos in schools (and office buildings) poses a potential health hazard for teachers and other workers. As suggested by these data, there may also be a risk for the school children. It is estimated that between two and six million school children and 100,000 to 300,000 teachers have been exposed to asbestos in schools.²³ The basis for this estimate was environmental sampling of air in the schools. A recent report suggests that such data may underestimate the risk.²⁴ The present report serves to emphasize the reality of the health risk from asbestos exposure in schools. Nonmalignant effects of school-based exposures are not as well characterized as the malignant ones.

SUMMARY

The causal relationship between malignant mesothelioma and exposure to asbestos is well established. In part as a result of that association, much public attention has focused on asbestos abatement in buildings, such as public schools.

in which that asbestos was used as a construction material. The present communication is a report of four cases of malignant mesothelioma in school teachers whose only apparent exposure to asbestos was in the schools in which they taught. The concerns raised by this report are also discussed.

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